ExpressCube™ 250

Dimensioning System

User Manual

RICE LAKE®
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About This Manual

This manual is provided for the use of trained and qualified installers of dimensioning systems, and represents the correct, safe and recommended methods for installing and using the *ExpressCube 250*™.

Authorized distributors and their employees can view or download this manual from the Rice Lake Weighing Systems distributor site at **www.ricelake.com**.

1.0 Introduction

The *ExpressCube 250* will quickly and accurately dimension and weigh cuboidal packages. The *ExpressCube 250* will calculate dimensional weight based on the acquired measurements and preprogrammed factors. The user can pre-program four factors that can be selected to calculate dimensional weight.

The *ExpressCube 250* can record package details using an optional handheld scanner. The measurements, dimensional weight, and, packaged details recorded from the hand scanner can be printed, read by user software for instant processing or sent to a central server for further processing.

1.1 Specifications

Physical Characteristics	
Dimensions: Inches	25.7 x 30 x 49.5 [L x W x H]
Dimensions: Centimeters	63.5 x 76 x 126 [L x W x H]
Weight (lbs) / (kg)	70 / 23
Operating Environment	14 to 104 F (-10 to 40 C) @ 0 - 90 % Humidity
Imperial Measurements	
Max Dimensional Capacity (in)	23.8 x 25.8 x 37 [L x W x H]
Resolution/Min Dimensional (in)	0.2 / 2.4
Maximum Weight (lb)	70
Weight Resolution (lb)	0.1
Metric Measurements	
Max Dimensional Capacity (cm)	60 x 65.5 x 94 [L x W x H]
Resolution/Min Dimensional (cm)	0.5 / 6.0
Maximum Weight (kg)	30
Weight Resolution (kg)	0.05
Features	
Standard	Printer Port (RS-232)[1] Hand Scanner Port (RS-232)[2] USB Computer Port[3]
Optional	SizeIt™ Software ExpressCube controller ExpressCube customer display Ethernet LAN

Table 1-1. ExpressCube 250 Specifications [1]Printer not included; [2]Hand Scanner not included; [3]Computer not included

2.0 Equipment Setup

2.1 Unpacking

The *ExpressCube 250*™ is shipped with the back of the unit folded onto the platform. Carefully remove the unit from the packing material and place the unit in the final location prior to removing the shipping brackets that secures the back to the top platform.

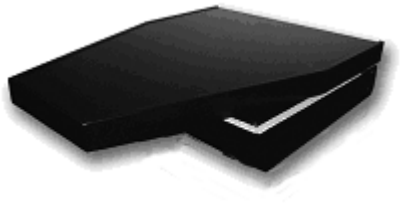

Figure 2-1. Unit Prepped for Shipping or Storage

Unscrew the leveling feet until approximately one-half inch is extended from the bottom of the unit. This will allow maximum flexibility in leveling the unit.

The *ExpressCube 250* may be provided with optional display and connecting hardware. It is important to review the equipment list provided in the shipping container to ensure that all items have been removed prior to disposal of the shipping container.

NOTE: With the protective shipping brackets removed, care must be taken not to subject the folded back assembly to any twisting or impacts that could harm the hinge assembly.

2.2 Location and Placement

Refer to "Specifications" on page 1 to obtain the outside dimensions of this model of *ExpressCube 250*. This unit should be placed on a countertop or table that has a surface area that is equal or greater to the physical dimensions referred to in the specifications. It is important for accurate weight measurements that the surface is reasonably level, flat and stable.

Ensure that the area selected for the *ExpressCube 250* is free from objects that could touch the unit and that there is adequate space to place and measure packages without obstruction.

The *ExpressCube 250* should be located within four feet of a power source. Verify with the specifications and the power adapter shipped that the power source and the *ExpressCube 250* power adapter are compatible.

2.3 Opening and Securing the Back Sensor Array

Refer to the diagram below to raise and secure the back sensor array from the shipping / storage position. Inspect the device before starting the procedure to ensure that all bindings and/or shipping restraints have been removed.

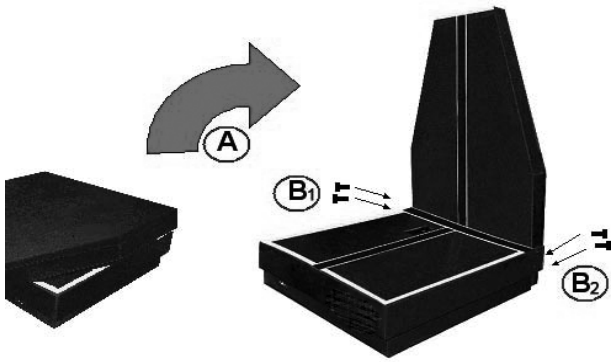

Figure 2-2. Opening and Securing Unit

(A) Carefully lift up the rear sensor panel 90 degrees to the surface of the platform until the holes at the rear of both parts of the assembly line up.

(B) Insert the supplied four locking bolts into the back assembly and tighten.

NOTE: It is important to put the locking bolts in without cross threading. Although the back assembly requires little effort to be held in place, it is recommended that one person hold the back sensor panel in place while a second person installs the locking bolts.

3.0 Electrical Connections

The *ExpressCube 250*™ is designed such that there is space to connect and run the cables from the rear connector panel. Do not use this space to bunch and store excess cable as the movement of the platform could be restricted by cable contact.

3.1 Rear Connecting Panel Layout Summary

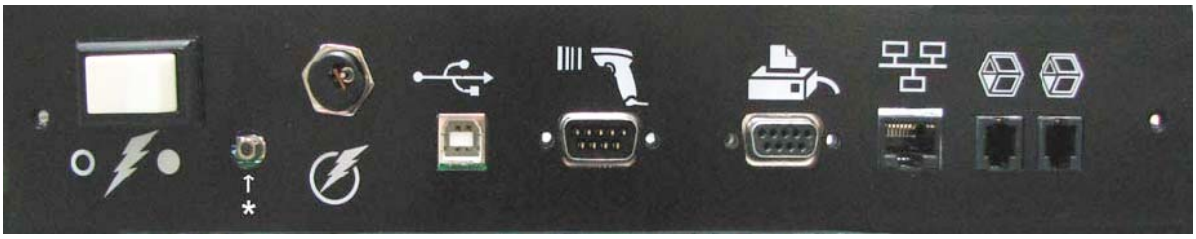

Figure 3-1. Rear Connecting Panel Layout Summary

Symbol	Function	Description
	Power Switch	Switches unit ON / OFF
* (unmarked)	Calibration	*Authorized Personnel Only* Removal or damage to the calibration seal voids certification approvals
	Power Adapter	The universal power adapter includes 4 power connections and has the following world safety approvals: UL / ULC, CE, PSE, BS, GS, FCC, SAA
	USB	This USB port can be used by a local PC to Operate and collect data from the unit.
	Hand Scanner	Connect to handheld scanner (not supplied). The port is a male RS-232 serial interface.
	Printer	RS-232 male port provides ASCII data output for either a printer or direct data logging onto a hard drive via a local PC application (not supplied).
	LAN	10Base-T Ethernet port (optional). Permits remote data collection onto centralized servers for billing, accounting etc. Ideal for machines in warehouse locations.
	External Devices	These connectors are used to connect external devices such as the customer display or control box.

Table 3-1. Rear Panel Layout Descriptions

NOTE: Connect all the appropriate connectors prior to connecting the power adapter and activating the device.

3.2 USB Connection

The *ExpressCube 250* series of dimensioning devices are equipped with a USB connection to interface to a local computer. The USB connection allows the computer to control and capture data from the dimensioning device. The USB is fully compatible with USB 2.0 computer ports.

Connect the cable as indicated in Figure 3-2.

Computer USB port and connector

ExpressCube 250 USB port and connector

Figure 3-2. USB Connection

NOTE: SizeIt™ software must be installed on the computer before the USB interface can be used. Refer to the "SizeIt™ Software Installation" on page 7 for more details.

3.3 Connection of a Handheld Bar Code Scanner

The *ExpressCube 250* has a dedicated male RS-232 serial port for use with a handheld bar code scanner.

NOTE: Handheld scanner not supplied.

The RS-232 connector should be securely connected to the appropriate connector on the *ExpressCube 250*.

Figure 3-3. Sample RS-232 Hand Scanner

NOTE: There are two RS-232 connectors on the connector panel but each one serves different purposes. Be sure to use the connector identified for the hand scanner.

The *ExpressCube 250* unit has programming options that can utilize the trigger of the handheld scanner to activate data collection and processing. For more details, refer to "User Programming" on page 9

3.4 Connection settings for hand scanners

Connection port	RS-232
Baud rate	9600
Parity	None
Data bits	8
Stop bit	1 and add a suffix of a CR LF (Carriage Return Line Feed)

Table 3-2. Connection Settings for Hand Scanners

3.5 Printer Connection

The *ExpressCube 250* is equipped with a female RS-232 serial printer port. The port is activated when the unit has acquired data through a successful measurement. Upon receiving a Print command, the printer port will deliver the data in an ASCII format that is terminated with a line feed and carriage return. The RS-232 connector should be securely connected to the appropriate connector on the *ExpressCube 250*.

Figure 3-4. Star SP-300 Printer

NOTE: The ExpressCube 250 has been specifically set up using the Star SP-300 Series ASCII model. While most ASCII RS-232 printers follow virtually identical data formats, the user is responsible to assure their selected printer is compatible to the Star-300 series format.

3.6 Connection of the Ethernet LAN (Option)

The *ExpressCube 250* can be equipped with an active 10 Base T Ethernet LAN port. The user can send acquired measurement data to a remote server for recording and/or billing purposes. The LAN device is only used to record package data and cannot be used to control the *ExpressCube 250* functions.

The LAN connector is a standard RJ-45 connector. The LAN port configuration is programmed through the USB connector using the *ExpressCube 250* maintenance software. The port configuration is recorded on non-volatile memory and will remain until reprogrammed through the USB connector.

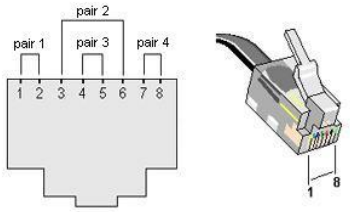

Figure 3-5. RJ-45 Connector

NOTE: A physical LAN port is included on the rear connector panel of all** ExpressCube 250 **units but the necessary support hardware & software is an option that must be ordered from the factory at the time of original purchase.

3.7 External Device Ports

The *ExpressCube 250* external ports are high-speed data and power ports that are used to connect to optional *ExpressCube 250* equipment. There are two external device ports on the rear connector panel. The two *ExpressCube 250* external devices supported by these ports are the control unit and the ExpressCube customer display unit as illustrated in Figure 3-6.

LCD Controller Wall Mount | *LCD Controller Desk Mount* | *Customer Display*

Figure 3-6. External Devices

The ExpressCube controller has a reversible mounting plate that allows the controller to be converted from a desk mount (as shipped) to a wall mount. To change the configuration, remove the four screws holding the bracket. Rotate the mounting bracket 180 degrees and secure with the same four screws.

The *ExpressCube 250* external device ports use RJ-11 four wire connectors. Place or mount the device to be connected in the location that it will be used. Insert the RJ connector until an audible click is heard. Carefully route the cable and insert the RJ-11 connector into either one of the two *ExpressCube 250* external device ports.

Warning The RJ-11 is a popular jack used by manufacturers for a variety of different devices and purposes. Do not insert any other manufactured device equipped with a RJ-11 into the *ExpressCube 250* device port. The attempted use of this RJ-11 port for any device other than a *ExpressCube 250* device can cause internal damage and void the warranty.

The *ExpressCube 250* external device ports provide low voltage power to operate the circuits and backlit LCD displays of the external devices. Care should be taken to ensure that no foreign objects are inserted into these ports.

3.8 Power Adapter Connection

After connecting the appropriate connectors as detailed in Section 3.1 to 3.7, insert the power adapter plug into the *ExpressCube 250* rear connector panel.

Figure 3-7. Power Adapters

The cable from the rear of the unit to the adapter should be free from obstruction and located to prevent accidental removal from *ExpressCube 250* or the outlet. Securely connect the power plug into an electrical outlet.

NOTE: Use only** ExpressCube 250 **power adapters with the unit. The power adapter must have unrestricted airflow around it. Do not wrap or enclose the power adapter.

4.0 Selecting User Control

The *ExpressCube 250*™ system must have an operator controller to perform the measurement functions. The system can be controlled either by a desktop computer using the USB interface or by using the ExpressCube controller. If a display is required to monitor the operation, it is recommended to use the ExpressCube customer display.

4.1 ExpressCube Controller

The use of the ExpressCube controller only requires the appropriate electrical connection as described in the section "External Device Ports" on page 5. The installation of the *SizeIt*™ software is not required. Proceed to "Power-Up" on page 8 of this manual.

4.2 Computer Control

The use of a computer to control the *ExpressCube 250* system will require the installation and use of the *SizeIt* software. Connect the USB cable as previously described and follow the instructions outlined in the "SizeIt™ Software Installation" on page 7.

NOTES:

In this manual, the term control panel will reference the device used to control the *ExpressCube 250* ***system. For example, ExpressCube controller or local computer running*** *SizeIt*™ ***software.***

When the ExpressCube controller is used to control the *ExpressCube 250,* ***the USB port is still active and can be used by a trained technical or administration personnel to service the unit.***

5.0 SizeIt™ Software Installation

The *SizeIt*™ software allows a local computer to operate and gather data from the *ExpressCube 250*™ with the USB port. This software must be installed and the USB connected prior to powering-up the *ExpressCube 250*. The software is not required if the ExpressCube controller is used to control the countertop unit.

5.1 Minimum Computer Requirements

- Minimum 512 meg of available RAM
- Pentium IV or better @ 2.0 GHz or better
- Windows XP operating system
- CD-ROM drive
- Java version 1.5.0_06 or later

5.2 Software Installation

1. Close down all applications currently running on the PC.
2. Insert the CD program disk into the CD-ROM drive of the computer.
3. Click the Windows 'START' button and select 'RUN'
4. Use the browse key to locate and select the 'set-up' file on the CD-ROM drive
5. Run the selected file.

NOTE: If you encounter recurring problems with the operation of the program, un-install Size-It and re-install.

The person installing the software should have the appropriate system permissions to install the software, this will vary for the system & location, and this can be especially critical for Windows XP operating systems.

5.3 Running the Software

Use either the Start/Program or Desktop menus to begin the *SizeIt*™ program. The program will open the control page as shown in Figure 5-1. Select the highest "com number" on the drop menu to engage the USB. Choice shown as 'com 7' in Figure 5-1.

Figure 5-1. SizeIt™ Control Page

The USB port will remain off when the *ExpressCube 250* unit is not powered. The 'Set-up' key will not work until communications is established on the USB link.

6.0 Power-Up

Locate and activate the power switch located on the rear panel. The *ExpressCube 250*™ must not have anything on the platform when the power is switched on. Almost instantly, the power [RED] indicator LED will begin to flash and then remain lit. During the brief time that the LED is flashing, power has been applied to the main computer and it has started its program initiation. The steady LED indicates that the power is on, the sensors are calibrated and the main computer is operating properly.

NOTE: The four indicator LEDs on the front of the** ExpressCube 250 **are intended to give the user a quick summary of the current operation of the unit. These LEDs are controlled by the measuring device and are not affected by the controller, including third party software. Always refer to the control panel display for detailed operational status.

6.1 Initial Power-up System Check

The motherboard enters a self-diagnostic routine in which errors are reported in a diagnostic log. The results of the diagnostic routine contain a summary of the polling the different subsystems of the *ExpressCube 250*

This section just briefly describes the system checks carried out by the motherboard as it is powered up. It is carried out almost instantly and has no visible effect on the operation of the unit.

Function	Description
System Check	The system verifies the proper operation of on-board components.
Configuration	Each power up cycle, the motherboard polls and assigns addresses to the Integrated Transceiver Array which performs the package measurements.
Load Cell	The motherboard verifies the operation of the load cells and programs the filters used in the digital interface.

Table 6-1. System Checks

Any irregularities are recorded as maintenance codes and can only be accessed by a software header in the motherboard.

NOTE: The control panel will be ready for operation after the system check is performed within a few milliseconds of power-up. If the display or system does not appear to be functioning, see "Troubleshooting" on page 19. DO NOT ATTEMPT TO OPEN THE SYSTEM.

7.0 User Programming

The *ExpressCube 250*™ has a simple programming menu that allows the user to program the following characteristics:

- Program dimensional weight factors.
- Handheld bar code scanner Acquire & Print synchronization.
- Adjust audible (beep) warning characteristics.
- Set device number.

Generally the user programming is set once and rarely requires adjustment. All programmed selections are stored and will remain until changed through the user programming.

User programmed features and data is stored on non-volatile memory and will be retained even if the *ExpressCube 250* is not powered.

7.1 Using the ExpressCube Controller Keypad for Programming

The ExpressCube controller keypad has been designed to easily make adjustments using the user-programming feature. Respond on the numeric keys as directed by the display to make a menu selection.

Use the UNITS button to toggle between in/lb and cm/kg. Use the ACQUIRE button to enter a typed numerical value.

7.2 Using the PC running SizeIt™ for Programming

The programming menu can be easily accessed from the PC running *SizeIt*™ software program by clicking the Settings [Prog] key using the mouse cursor. All menu selections can be selected by the mouse and normal PC keyboard functions can be used to edit data entries.

7.3 Using the PC running a Third Party Software for Programming

The *ExpressCube 250* has an API interface which allows third party software to operate, acquire data and utilize the user program feature set. Refer to the manufacturer's instruction on the use of programming features with the third party software.

Warning Third party software will have access to all data from the *ExpressCube 250* data including measurements, units, dimensional weight, dimensioning factor and handheld scanner codes; however, the software manufacturer may use the *ExpressCube 250* to measure, weigh and collect handheld scanner codes only. If the third party software determines dimensional weight, only accessing the third party software can change dimensional weight factors.

7.4 Main Programming Menu

7.4.1 Alter Dimensional Weight [DIM] Factors

Selecting this menu allows the user to review or change any of the four dimensional factors used by the *ExpressCube 250* computer to calculate dimensional weight.

Sub-menu

1. (Dim Factor) [Units]
2. (Dim Factor) [Units]
3. (Dim Factor) [Units]
4. (Dim Factor) [Units]
5. BACK

Select the dim (dimensional weight) factor that you wish to change and verify the correct units before entering the new value.

The dimensional weight factors can only have four digits with the last digit representing units or tenths (000.0 to 9999). Any entry of four or less digits will be assumed whole numbers unless a decimal is used.

The maximum dim factor setting is 276 in^3/lb.

The Dim Factors are displayed in the units that they were originally input but the *ExpressCube 250* computer will convert the dimensional weight factors to match the units that are used.

The dimensional factor displayed and output from the unit will always match the units that the measurements were taken.

7.4.2 Manual / Automatic Operation

This selection provides an option for an automatic recording of the measurement data after the data is collected. The automatic operation can significantly speed the measurement process and is used when there is no requirement to review acquired measurements before recording them.

Manual Operation

If the *ExpressCube 250* is in a ready state to record the measurement, the user will press the Acquire key or (if equipped) the trigger of the handheld scanner. The acquired measurement data will be displayed but the user must activate the SEND / PRINT key to record the data. Removal of the package from the platform will clear any acquired measurements and prepare the device for a new measurement sequence.

Automatic Operation

If the *ExpressCube 250* is in a ready state to record the measurement, the user will press the trigger of the handheld scanner (if equipped). The *ExpressCube 250* will record the measurements and automatically send the acquired data with the bar code as if the SEND button had been pushed. All acquired data will remain in the display until the parcel is removed from the *ExpressCube 250* platform.

Sub-menu

MANUAL / AUTOMATIC OPERATION

1. MANUAL <SELECTED>
2. AUTOMATIC
3. GO BACK
4. EXIT

Press the appropriate number to select the desired operation mode. The current selection will be indicated by the <SELECTED> beside it. After verifying the correct selection, use EXIT function to return to the main menu.

7.4.3 Adjust Beep Duration

This selection will permit the user to adjust or turn off the warning beep tone.

Sub-menu

SELECT 0-9

CURRENT SELECTION 6

Enter a digit from 0 (off) to 9 to set the audible tone. The current selection will be updated and the selection confirmed in large format. After the confirmation, the program will exit to the main menu.

7.4.4 Set Device Number

This selection allows the user to set a device number for the *ExpressCube 250*. The device number is sent with each data message of acquired data. This device number can be used to track a box through a facility.

Sub-menu

CURRENT DEVICE NUM XXX (000-999)

If device number requires change from the current number, type in the three-digit new device number. When the new device number is confirmed on the display, the program will automatically exit to the main menu.

Pressing the PROG key will exit the menu without changing the device number.

8.0 Operation

The *ExpressCube 250*™ is a very accurate Multi-Dimensional Measuring Device (MDMD) that is capable of measuring cuboidal (rectangular/square) boxes with great precision. The *ExpressCube 250* has built in controls to prevent erroneous readings that cannot be altered by third party software control. Even with these built in controls, the user must exercise care to follow these guidelines:

- Boxes cannot exceed the dimension and weight listed in the specifications.
- Boxes must be cuboidal (for example, rectangular or square).
- Severely damaged packages or packages covered by excessive mud or ice can cause errors for both dimensions and weight.
- Both the platform and the package being measured must be free from physical contact with surrounding objects.
- Place objects on the platform. Do not drop packages onto the platform.

NOTE: Keep the platform clean and free of dust build up to ensure optimum operating performance.

8.1 Main unit LED indicators

The main unit LED indicators are a set of four LEDs mounted on the front of the main platform of the *ExpressCube 250*. They give an accurate status of the *ExpressCube 250* main computer and are unaffected by third party software.

Figure 8-1. Main Unit LED Indicators Location

Color	Definition
Red - Power	A steady illumination indicates that the unit has power.
Yellow - Valid Dimension	A steady illumination indicates that the unit has measured a parcel placed on the platform.
Green - Valid Weight	A steady illumination indicates that the unit has weighed a parcel placed on the platform.
Blue - Zero	A steady illumination indicates that the unit is in a zero (no-load) condition.

Table 8-1. Description of LED Colors

NOTE: The unit will not attempt any new measurement until the unit has reached a zero condition after the removal of the previous package. The Yellow and Green LED indicators will remain in the ACQUIRED state until a zero condition is achieved after the last recorded measurement.

8.2 Operation with Third Party Control Software

If this *ExpressCube 250* is used with third party software (not an *ExpressCube 250* control panel), it is important that the user studies the documentation that is supplied with the third party software.

It is not possible for the third party software to affect the integrity of the measurements output from the *ExpressCube 250*. The acquired data is output only if the correct procedures have been followed (zero condition, etc) and the output data itself is packaged with all related measurement parameters in the data packet. However, it can be difficult for the user to initiate this sequence without a full understanding of the software being used.

NOTE: It is recommended that third party software users read the following operation procedures for the control panel. The procedure for obtaining a measurement is identical and helpful points presented in the manipulation of the package will be useful.

8.3 Preparation for Measurements

The *ExpressCube 250* should be powered up and the *ExpressCube 250* control panel display finished the initial system check. Prior to starting measurements, it is recommended that the platform and sensors be wiped with a damp rag to remove any accumulated dirt and/or debris.

Select the units and dimensional factor (if used) for measuring the parcel.

8.4 Zeroing the ExpressCube 250

The *ExpressCube 250* will not record any measurements unless the platform has recorded the Zero condition (weight of the platform in an idle condition) prior to a package being placed on the platform. After verifying that the measurement platform is empty, press the ZERO function button on the *ExpressCube 250* control panel.

The Blue LED under the platform will light and a zero condition will be indicated by the word ZERO on the display of the *ExpressCube 250* control panel. The Zero condition display for both of the *ExpressCube 250* control panels is show in Figure 8-2.

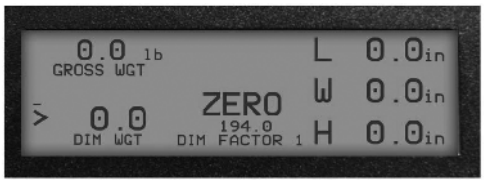

Figure 8-2. ExpressCube Controller Display

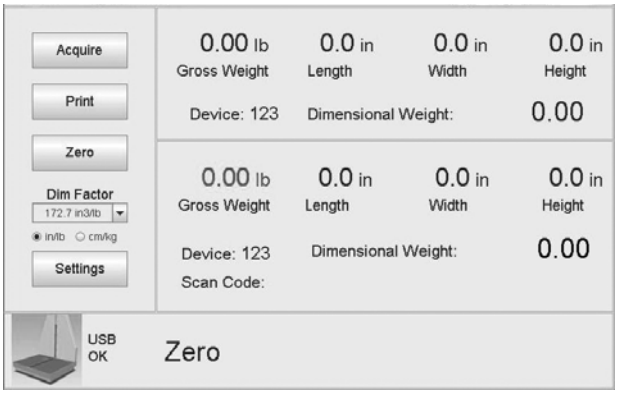

Figure 8-3. SizeIt™ Display

8.5 Placement of Box for Measurement

Place the box to be measured flush against the back of the *ExpressCube 250* such that one side of the box is in contact with the rear face. The orientation of the box is arbitrary as long as it:

- Sits over the center array
- Is flush (contact) to the back
- Sits within the guidelines

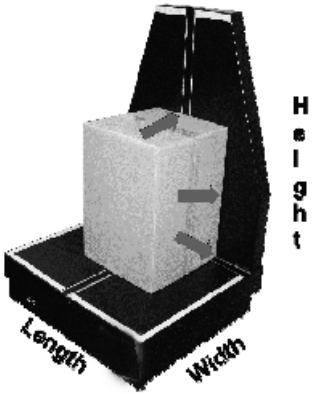

Figure 8-4. Example of Box Placement

Figure 8-4 shows an example of a box ready for measurement and indicates how the dimensions will be recorded.

8.6 Verifying That the Parcel is Ready to Measure

Once the box is in place, the *ExpressCube 250* will resolve the weight and dimensions. A successful measurement is indicated by the steady illumination of the yellow LED (valid dimension) and the green LED (valid weight) on the front of the platform. The *ExpressCube 250* control panel will also have valid measurement indicators with the actual measurements displayed.

If the weight has not been resolved, the problem could be caused by:

- The box weight exceeds specifications. Weight will read OVER.
- The *ExpressCube 250* was not in a zero condition prior to the box placement on the platform.
- The *ExpressCube 250* is undergoing vibrations or movement that prevent weight resolution.

If the dimensions cannot be resolved, all dimensions will read N/A. If a cuboidal package is placed within the guidelines and there is not a valid dimension obtained, the problem could be caused by:

- The box dimension does not fall between the minimum and maximum the specifications.
- The box is not flush against all three dimensional arrays.
- There is excessive dirt or an object blocking the measuring arrays.

NOTES:

If the unit is unable to resolve a valid dimension, it will behave as a weigh scale. In this condition, acquiring a measurement will only record the weight and a scan code (optional).

If the unit is equipped to dimension only, the unit will not record a measurement unless a valid dimension is obtained.

The ready to acquire condition (valid measurements) display for both of the *ExpressCube 250* control panel is shown in Figure 8-5 and 8-6.

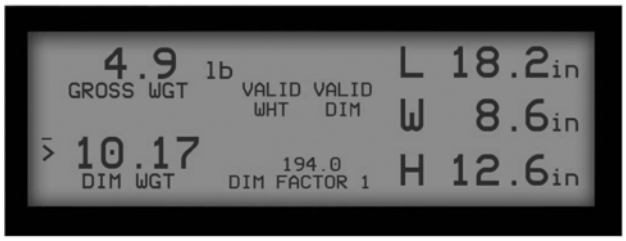

Figure 8-5. ExpressCube Controller Display

Figure 8-6. SizeIt™ Display

8.7 ExpressCube Controller Quick Setup Guide

1. Carefully remove the ExpressCube controller from the packing material and place the unit in the final location.

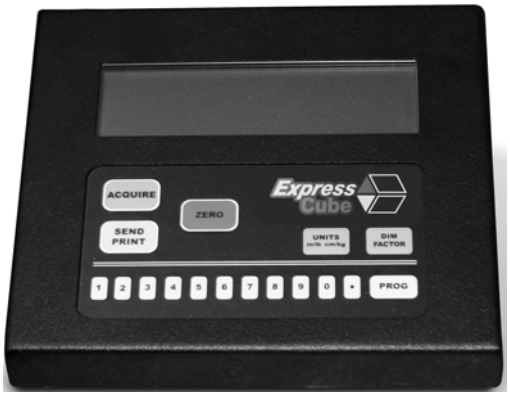

Figure 8-7. ExpressCube Controller

2. Place the device to be connected in the location that it will be used.
3. Carefully route the cable and insert the RJ-11 connector into either one of the two *ExpressCube 250* external device ports.

Figure 8-8. External Device Ports

4. The control panel will be ready for operation after the system check is performed within a few milliseconds of power-up.

Figure 8-9. Control Panel

8.8 Programming Dimensional Weight (DIM) Factors

Selecting the program button (PROG) allows the user to review or change any of the four stored DIM factors used by the *ExpressCube 250* computer to calculate dimensional weight.

Select the DIM factor that you wish to change and verify the correct units of measure (Metric or Imperial) before entering the new value.

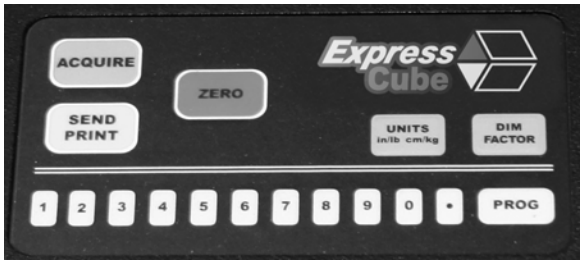

Figure 8-10. Control Panel

Select an Option

1. To program, press and hold PROG for 1 second.
2. Change DIM Factor.
3. Change Scanner Trigger.
4. Change Device Number.
5. Exit (or Press PROG).

Select the Unit Type

1. To program, press and hold PROG for 1 second.

NOTE: Press buttons firmly when selecting.

2. Metric
3. Imperial
4. Go Back
5. Exit (or Press PROG)

Select the Imperial DIM Factor to Change

1. To program, press and hold PROG for 1 second.
2. 154.9
3. 192.0
4. 145.0
5. 105.1
6. Go Back
7. Exit (or Press PROG)

Input New DIM Factor to Replace Current Number

1. To program, press and hold PROG for 1 second.
2. Enter new number.

Accept New DIM Factor “xxx.x”

1. Select Yes or No

The dimensional weight factors can only have four digits with the last digit representing units or tenths (000.0 to 9999). Any entry of four or less digits will be assumed whole numbers unless a decimal is used.

The maximum dim factor setting is 276 in^3/lb.

8.9 ExpressCube Controller Display

LCD display functions are highlighted here to acquaint you with the measurement process.

Gross weight is shown with one decimal figure, which conforms to the current measure unit specification.

Figure 8-11. Gross Weight Shown

The word "RES" will appear while the system is resolving a valid weight and/or a valid dimension.

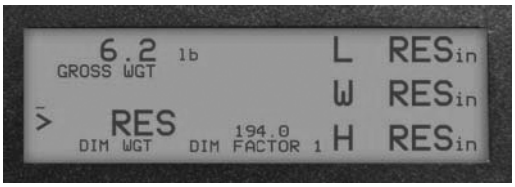

Figure 8-12. System Resolving a Valid Weight Menu

After a box has been placed on the platform for measurement, the "Acquire" button can be pressed at any time while the system is still in the "RES" (resolve stage). This allows faster weight and dimension acknowledgement and eliminates the need to wait for the "Valid" numbers to settle in first, as required previously.

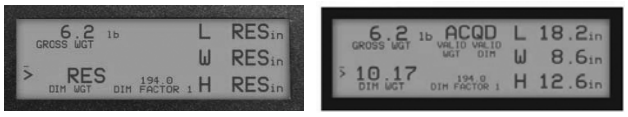

Figure 8-13. From Resolve Stage to Acquire Menus

A very important addition to the capability of the new updated diagnostic version enables the operator to perform the sensor array bank calibration. This procedure can be a valuable addition to a regular maintenance program as the calibration will help the sensor measurements to run at peak performance and correct any unexpected aberrations on the lens that can affect accurate readings. To access the Calibration DIM Banks feature, press "PROG" on the keypad, then select number "5" and then follow the instructions on the display.

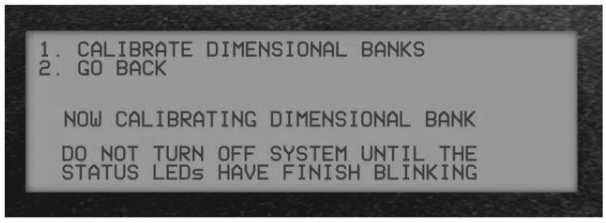
1. CALIBRATE DIMENSIONAL BANKS
2. GO BACK
NOW CALIBRATING DIMENSIONAL BANK
DO NOT TURN OFF SYSTEM UNTIL THE
STATUS LEDs HAVE FINISH BLINKING

Figure 8-14. Calibrate DIM Banks Menu

8.10 Dimensional Weight and the Greater Weight Indicator

The *ExpressCube 250* is equipped with the capability to measure both dimensions and weight will use these measurements to calculate Dimensional Weight based on the user selected Dim Factor. It is important to realize that Dimensional Weight is meaningless unless the Dim Factor used to obtain it is known. For this reason, Dimensional Weight that is acquired will be recorded with the Dim Factor used to calculate it. Similarly, the Dimensional Weight and Dim Factor will be sent in the data that accompanies the measured data and scan code (optional).

NOTE: Since Dimensional Weight is a calculated weight; units are not displayed to prevent confusion with actual weight. Dimensional Weight is always the same units as actual weight.

The greater weight indicator on the *ExpressCube 250* control panel is a visual aid to the user to quickly identify the greater of measured or calculated Dimensional Weight. The indicator is not sent with the acquired data.

The greater weight indicator for each of the *ExpressCube 250* control panel is shown in Figure 8-15

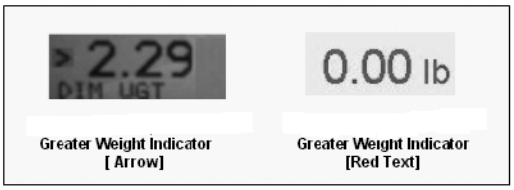

Figure 8-15. Greater Weight Display

8.11 Acquiring the Measurement Data (Manual Operation)

To record the measurement of the box on the *ExpressCube 250*, activate the ACQUIRE button on the *ExpressCube 250* control panel. Alternatively (if equipped), the handheld scanner will activate the Acquire sequence while reading the bar code on the package. The acquired data will be displayed on the *ExpressCube 250* control panel display.

If the data is not recorded, an audible beep will be heard. See Section 8.10 on page 15 and verify that the box is properly positioned for measurement.

NOTES:

If the box is removed from the platform without the SEND/PRINT button activated, the acquired data will be lost and the unit must return to the zero condition to start a new measurement.

After a successful measurement is acquired, the valid measurement indicators both on the front panel of the main unit and the control panel are held until a new measurement procedure is started.

Figure 8-16 and 8-17 below display the successful acquired measurement (ACQD) for both control panels.

Figure 8-16. ExpressCube Controller Display

Figure 8-17. SizeIt™ Display

8.12 Manual (Acquire & Send / Print) Operation

The acquired measurement data can be sent to the printer and any other devices or ports connected to the *ExpressCube 250* by activating the SEND/PRINT button on the *ExpressCube 250* control panel. The SEND / PRINT button will only respond once for every measurement taken.

The *ExpressCube 250* will attempt to successfully send the acquired measurement data through the various data ports until the *ExpressCube 250* returns to a zero condition. Any measurement data that has not been sent or printed will be cleared from the transmission buffer when the *ExpressCube 250* is in the zero condition.

NOTE: The** ExpressCube 250 **control panel display will continue to hold the acquired data until the box is removed.

8.13 Automatic (Acquire & Send / Print) Operation

This feature can be used when the AUTOMATIC OPERATION option is selected in the user program. See Section 7.4.2 on page 9. The *ExpressCube 250* must be ready for acquiring a measurement as described in Section 8.6. To acquire and record the measurement of the box on the *ExpressCube 250*, the handheld scanner will activate the Acquire and SEND / PRINT sequence while reading the bar code on the package. The *ExpressCube 250* will receive the data from the handheld scanner and append it with the acquired measurement data. The acquired data will be displayed on the *ExpressCube 250* control panel display.

The *ExpressCube 250* will attempt to successfully send the acquired measurement data through the various data ports until the *ExpressCube 250* returns to a zero condition. Any measurement data that has not been sent or printed will be cleared from the transmission buffer when the *ExpressCube 250* returns to a zero condition.

If the measurement data is not acquired, an audible beep will be heard. The user should refer to Section 8.5 and verify that the box is properly positioned for measurement.

NOTES:

The** ExpressCube 250 **control panel display will continue to hold the acquired data until the box is removed.

After a successful measurement is acquired and sent, the valid measurement indicators both on the front panel of the main unit and the** ExpressCube 250 **control panel are held until a new measurement procedure is started.

The successful acquired and sent measurement display for both of the *ExpressCube 250* control panels is shown in Figure 8-18 and 8-19 below.

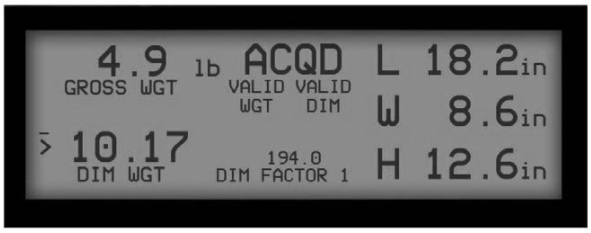

Figure 8-18. ExpressCube Controller Display

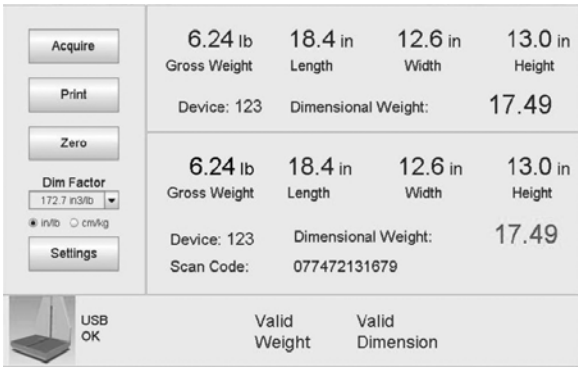

Figure 8-19. SizeIt™ Display

8.14 Using the ExpressCube 250 as a Weigh Scale Only

The *ExpressCube 250* can be used to measure the weight of non-cuboidal objects or cuboidal objects that physically exceed the dimensioning specifications of the machine. This feature allows the user to determine weight on courier documentation paks, odd package shapes including shipping cylinders, etc.

Place the package on the *ExpressCube 250* platform to physically limit as much package over-hang as possible. The *ExpressCube 250* will automatically reconfigure itself as a weigh scale when an object is detected on the platform that cannot be accurately dimensioned.

The *ExpressCube 250* unit acting as a weigh scale will indicate N/A on all measurements and calculations based on dimensional measurements. See Figure 8-20 and 8-21. Only the device number, weight and scan code (optional) are recorded during the Acquire sequence.

To acquire and record a weight, use the same procedure and options as described in the previous sections for obtaining and recording dimensions.

Figure 8-20. ExpressCube Controller Weight Only Display

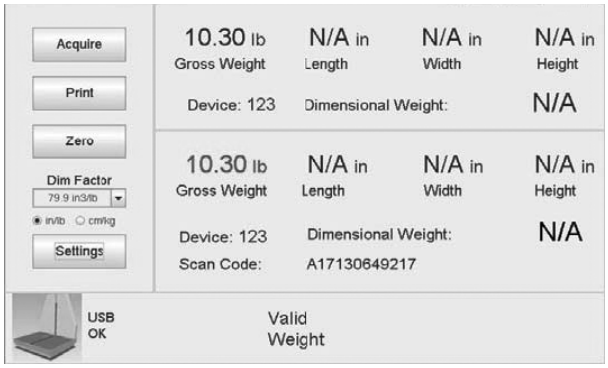

Figure 8-21. SizeIt™ Weight Only Display

9.0 Maintenance

The *ExpressCube 250*™ is a sealed certified device that does not require any internal periodic maintenance. In the event that the unit has incurred physical damage that may affect the operation of the unit, it should be sent back to an authorized service center for repair and recalibration.

9.1 Cleaning (Excluding the Sensor Lenses)

To maintain the optimum performance of the *ExpressCube 250*, the unit should be periodically cleaned to remove any build-up of dust and dirt. The black metal areas should be cleaned separately from the sensing strips. Use a damp cloth with a mild detergent and rinse with a clean damp cloth. Hand pumped sprayers can be used. Apply a non-corrosive cleaner to stubborn areas but care should be exercised to keep spray from the sensor strips.

NOTES:

Do not use any volatile liquids to clean the surface. This is an electronic device and trapped fumes in the enclosure could be ignited by the electronic circuitry.

Do not use any pressurized liquid source (e.g. water hose, steam jet, etc) to clean the unit.

9.2 Cleaning the Sensor Lens

It is important to keep the sensor lenses clean and free from any debris that may obscure the package from sensors. Use a soft clean cloth with commercial glass cleaner to clean the surface of the lens.

NOTE: Do not use abrasive or dry cleaners on the lens.

9.3 Replacing the Sensor Lens

If a sensor lens becomes foggy (opaque) from wear, cracked or broken it should be replaced. All three lenses have a cover to permit safe and quick replacement of the lens. The covers are held on by two screws and the locations are illustrated below.

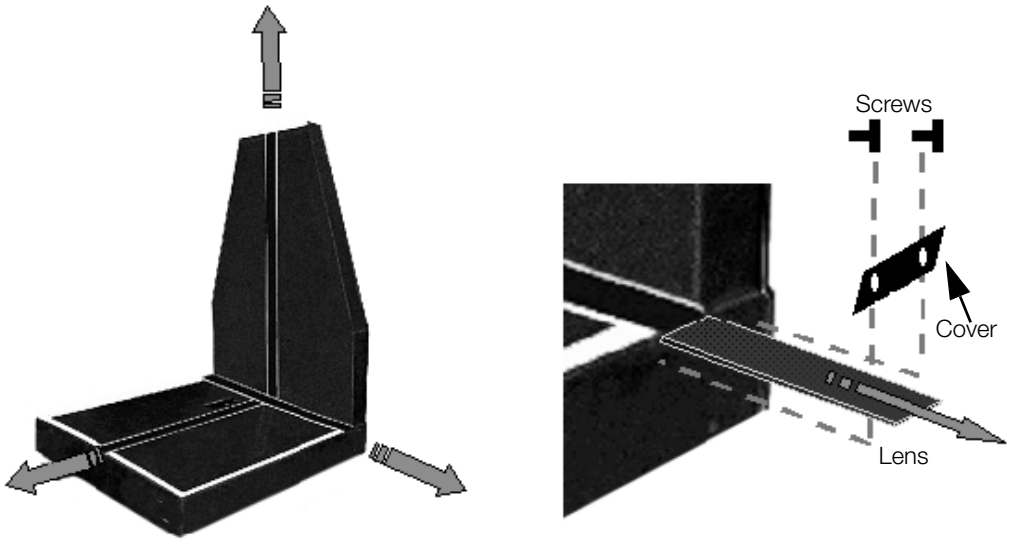

Figure 9-1. How to Replace the Sensor Lens

10.0 Troubleshooting

The *ExpressCube 250*™ is a multi-dimensional precision instrument designed to work in a variety of working environments. The internal assembly is sealed to preserve the integrity of this measuring instrument. There are a number of problems that may arise that can be addressed without tampering with the seals which are reviewed in this section along with problems involving possible parts replacement.

This section addresses problems that are occurring in lieu of the device being properly installed, cleaned and operated as per the above sections.

Only authorized technicians may break the seals to perform repairs on the *ExpressCube 250*. Unauthorized personnel breaking the seals for any reason will void the government certification and possibly void the warranty on the unit.

10.1 Unit Will Not Power Up

The unit is connected to the power supply that is connected to power but the operation of the OFF-ON switch has no affect. The red LED on the front of the platform is off.

Check (in numerical sequence):

1. Physically verify the connections of the power adapter to the power outlet and the power connector.
2. Verify the power outlet by connecting a lamp or other known operational device.
3. (Technician only) Remove the power adapter from the *ExpressCube 250* and verify that the voltage to unit is present [15 VDC]. If the voltage is not present, contact your sales representative for a new power adapter.
4. Contact your service center to arrange repair by a qualified service representative.

10.2 LCD Display is Not Working

The LCD display on the ExpressCube controller either does not display any intelligent characters or cannot control the *ExpressCube 250*.

Check (in numerical sequence):

1. Check that the red LED on the front panel of the unit is steady. If not steady, turn off the unit and remove power cord for 30 seconds. Reconnect the power and turn the power ON. If LED continues to flash, contact your service center to arrange repair by a qualified service representative.
2. Physically check the cable (authentic *ExpressCube 250* part) and the connections to both the *ExpressCube 250* connector panel and the controller.
3. Switch the connecting cable to the alternative external connector on the *ExpressCube 250* connector panel.
4. (Technician only) Use an Ohm meter to verify the cable conductivity and visually inspect the RJ connectors for physical damage.
5. Contact your service center to arrange repair by a qualified service representative.

10.3 PC Controller SizeIt™ is Not Working

The *SizeIt*™ software program running on the PC is not communicating with the *ExpressCube 250*.

Check (in numerical sequence):

1. Check that the red LED on the front panel of the *ExpressCube 250* is steady. If not steady, turn off the unit and remove power cord for 30 seconds. Reconnect the power and turn the power ON. If LED continues to flash, contact your service center to arrange repair by a qualified service representative.
2. Turn off the program in the computer and remove the USB cable until a tone is heard from the computer. Put in the USB and wait for a computer tone again. Restart the *SizeIt*™ software.
3. If the *SizeIt*™ program is still indicating that there is not USB connection; physically check the USB cable connections to both the *ExpressCube 250* connector panel and the controller.
4. If the *SizeIt*™ program is still indicating that there is not a USB connection, replace the USB cable.
5. (IT Technician only) Verify proper hardware and software operation of personal computer (PC). *ExpressCube 250* warranty only relates to the *ExpressCube 250* provided products as outlined in the "Hardware Warranty Statement" on page 24.
6. Contact your service center to arrange repair by a qualified service representative.

10.4 Maintenance Codes

The *ExpressCube 250* has built in diagnostic software programming which will report problems to a maintenance log. The maintenance will be displayed either as a code or the code related maintenance statement depending on the maintenance software connected to the access header.

Maintenance Code	Maintenance Statement	Comments	Troubleshooting
01	No platform Communication	There is no communications coming from platform	Authorized Service
02	USB - No Communication	There is no communication between the computer and the device	• Check connection • Check software installation
03	USB - Bad Communication	The communication between the computer and the device has numerous errors or intermittent	• Check connection • Check cable • Authorized Service
04	Scale Unstable	Unable to obtain stable readings from load cell	• Check the table for vibrations • Authorized Service
05	Bad length Communication	There is no / erroneous communications coming from length array	Authorized Service
06	Bad width Communication	There is no / erroneous communications coming from width array	Authorized Service
07	Bad height Communication	There is no / erroneous communications coming from height array	Authorized Service
08	Bad Controller Communication	There is no / erroneous communications coming from controller	• Check connections • Check cable • Switch ports • Authorized Service
09	Bad Display Communication	There is no / erroneous communications coming from customer display	• Check connections • Check cable • Switch ports • Authorized Service

Table 10-1. Maintenance Codes

11.0 Calibration Procedure

Warning Performed by Authorized Personnel Only

The *ExpressCube 250*™ is factory calibrated and sealed to preserve the integrity of the weight measurements. Removal of the calibration seal by unauthorized personnel will void government certification of the *ExpressCube 250* and could void the warranty.

11.1 Calibration Weight

The *ExpressCube 250* must be calibrated using a 50 pound calibrated weight only (25 kg weight where applicable). Both the platform and calibration weight should be clean before the procedure is started.

11.2 Procedure

1. Move the *ExpressCube 250* to permit access to the back panel of the device. It is important that there is no contact with the platform of the device when the calibration button is accessed or during the calibration process.
2. Remove the seal protecting the calibration button located on the back panel adjacent to the power switch. The unit should be powered and in an idle state.
3. Press the calibration button once until the Blue LED on the front panel is flashing. This will set the zero reference for the calibrated weight.
4. Carefully place the 50 pound calibrated weight on the center of the platform. Allow approximately 5 seconds for the platform to settle.
5. With the calibration weight in place, press the calibration button a second time to record the weight. The green LED will become steady.
6. Remove the calibration weight and power the unit off and on to lock in the new calibration table.
7. Re-seal the access to the calibration button.

NOTE: If a load cell is damaged from an accidental impact, calibration will not repair or mask the damage. Always contact your authorized servicing distributor to analyze weighing irregularities with the unit.

12.0 Appendix: Dimensional Weight & DIM FACTOR

12.1 The Importance of Volume and Weight of Cargo for Transportation

All cargo space involved in transporting goods has physical limits based on the volume of the cargo and the weight. Once a cargo has reached a limit in either volume or weight - the container (trailer, train, plane or shipping container) is transported. Weight has traditionally been the measurement which the transportation costs of individual packaged freight has been calculated.

The difference in weight and volume costs can be appreciated if one considered the expense of transporting a large volume with little weight, for example a large box of Styrofoam drinking cups. Transportation companies have recognized these variables and most have allocated a volume per weight standard in their billing to capture cargo of light density.

12.2 Dimensional (Volume) Weight

The dimensional weight (also known as volume weight) is the minimum weight that a package a given size may have that is handled by a carrier. A carrier may state that any package of one cubic foot (12"x12"x12") will have a minimum weight allowance of 10 pounds. If the cubic foot package actually weighs 8 pounds - it will be invoiced for 10 pounds. This is a minimum weight allowance - if the cubic foot package weighs 12 pounds - the charges will be based on 12 pounds.

There are no international or domestic standards concerning values of dimensional weight. A significant number of courier companies use the dimensional weight standard set by the International Air Transport Association (IATA) but many define their own dimensional weights.

The value of dimensional weights will probably change as the nature of shipments change over time. Organizations such as the International Air Transport Association (IATA) have produced studies that suggest the density of packaging is changing as the commodities become more high tech. As a result the IATA itself has already passed a resolution (Resolution 501) to change the IATA dimensional weight.

12.3 DIM Factor (Dimensional Weight Factor)

The DIM factor is a mathematical factor used to calculate the dimensional weight of an object. The DIM factor represents the volume of a package allowed per unit of weight. Although mathematically related, the DIM factor is different for measurements in units of inches/pounds and for measurements in centimeters/ kilograms.

All major courier companies now apply the DIM Factor to every cuboidal (rectangular/square) parcel that they handle to determine the dimensional weight. They then adjust customer invoicing to reflect charges based on the greater weight between actual weight and dimensional weight.

Finding a DIM Factor using in/lb

Find the DIM factor if each cubic foot (12"x12"x12") has a minimum weight allowance of 10 pounds:

$$\frac{1\text{ cu ft}}{10\text{ lbs}} \quad \frac{12"x12"x12"}{10\text{ lbs}} \quad \frac{1728\text{ in}^3}{10\text{ lbs}} \quad \boxed{172.8\text{ in}^3/\text{lb}}$$

Finding a DIM Factor using cm/kg

Find DIM factor if each cubic meter (100cm x 100cm x 100cm) has a minimum weight allowance of 200 kg:

$$\frac{1\text{ m}^3}{200\text{ kg}} \quad \frac{100\text{cm x}100\text{cm x}100\text{cm}}{200\text{ kg}} \quad \frac{1000000\text{ cm}^3}{200\text{ kg}} \quad \boxed{5000\text{ cm}^3/\text{kg}}$$

12.4 Using DIM Factor (Dimensional Weight Factor)

The DIM Factor provides a quick determination of the dimensional weight of any cuboidal package. The best way to describe this application is by an example of the application and use of the DIM Factor by a courier company:

What is the billing rate of a 10"x 12"x 14" package that weighs 8 lbs by a courier that has a minimum dimensional weight of 10 lbs per cubic foot (i.e.: DIM Factor = 172.8 in^3/lb)?

$$\frac{\text{Volume}}{\text{DIM Factor}} \quad \frac{\text{Volume}}{\text{Volume / lb}} \quad \frac{10\text{x}12\text{x}14\text{ in}^3}{172.8\text{ in}^3/\text{lb}} \quad \frac{1680\text{ in}^3\text{ lb}}{172.8\text{ in}^3} \quad \boxed{9.7\text{ lb}}$$

The courier company will invoice based on 9.7 lbs - the dimensional weight.

NOTE: This is an example. Some courier companies always round dimensional weight up to the next pound, which in this sample would make the billing weight 10 lbs.

12.5 Dim Factor Conversion Between in^3/lb and cm^3/kg

The *ExpressCube 250*™ will automatically adjust the selected DIM Factor to correspond to the units selected by the user. The mathematical relationship between DIM Factors can be expressed as follows:

Dim Factor [cm^3/kg] = Dim Factor [in^3/lb] x 36.12728079

Dim Factor [in^3/lb] = Dim Factor [cm^3/kg] x 0.027679913

Some DIM Factors may be provided in both units such as the IATA value of Dim Factor 166 in^3/lb or Dim Factor 6000 cm^3/kg. These have been slightly modified for ease of application. The *ExpressCube 250* will correctly convert a user-selected input of Dim Factor 166 in^3/lb to Dim Factor 5997 cm^3/kg. This 0.05% difference is not large enough to affect dimensional weight readings. The user can input another DIM Factor of 6000 cm^3/kg if desired and choose from two different Dim Factor selections depending on the units selected.

Hardware Warranty Statement

Rice Lake Weighing Systems (RLWS) warrants that all RLWS brand equipment and systems properly installed by a Distributor or Original Equipment Manufacturer (OEM) will operate per written specifications as confirmed by the Distributor/OEM and accepted by RLWS. All systems and components are warranted against defects in materials and workmanship for two (2) years, unless otherwise stated.

RLWS warrants that the equipment sold hereunder will conform to the current written specifications authorized by RLWS. RLWS warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, RLWS will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:

Upon discovery by Buyer of such non-conformity, RLWS will be given prompt written notice with a detailed explanation of the alleged deficiencies.

Individual electronic components returned to RLWS for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in a publication, "Protecting Your Components From Static Damage in Shipment," available from RLWS Equipment Return Department.

Examination of such equipment by RLWS confirms that the non-conformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair, or improper testing. RLWS shall be the sole judge of all alleged non-conformities.

Such equipment has not been modified, altered, or changed by any person other than RLWS or its duly authorized repair agents.

RLWS will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways

In no event will RLWS be responsible for travel time or on-location repairs, including assembly or disassembly of equipment. Nor will RLWS be liable for the cost of any repairs made by others.

THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER RLWS NOR DISTRIBUTOR WILL, IN ANY EVENT, BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

RLWS AND BUYER AGREE THAT RLWS' SOLE AND EXCLUSIVE LIABILITY HEREUNDER IS LIMITED TO REPAIR OR REPLACEMENT OF SUCH GOODS. IN ACCEPTING THIS WARRANTY, THE BUYER WAIVES ANY AND ALL OTHER CLAIMS TO WARRANTY.

SHOULD THE SELLER BE OTHER THAN RLWS, THE BUYER AGREES TO LOOK ONLY TO THE SELLER FOR WARRANTY CLAIMS.

No terms, conditions, understanding, or agreements purporting to modify the terms of this warranty shall have any legal effect unless made in writing and signed by a corporate officer of RLWS and the Buyer.

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